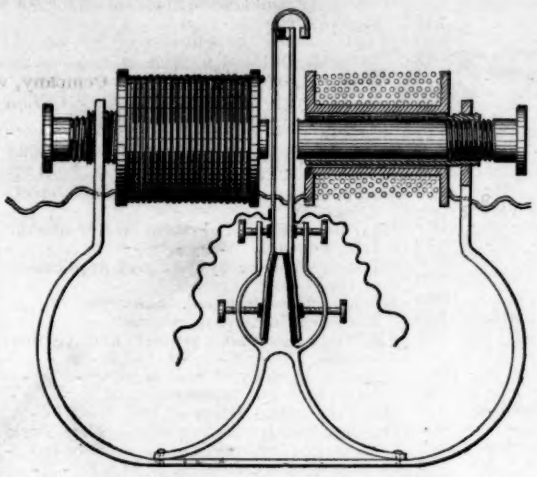
OUR ILLUSTRATED RECORD OF ELECTRICAL PATENTS.

PATENTS DATED JUNE 7, 1887.

364,204. Railway Signal; J. H. Armstrong, Houston, Texas. Application filed Oct. 15, 1886. Instruments on trains are connected up in multiple arc on a line running with the track.

364,221. Equipment for Theatrical Stages; John Curry, New Orleans, La., Assignor of one-fourth to W. P. Sweatman, Wm. Rice and Barney Fagan, all of New York, N. Y. Application filed March 12, 1887. A series of chairs of different heights are arranged on a stage, each chair provided with an electric lamp, all of the lamps being controlled by a single switch.

364,235. Electric Gas Lighting Apparatus; I. Fisher, Medford, Mass. Application filed June 7, 1886. In this device a magneto-generator is used to produce the spark. The operation required to generate electricity first turns on the gas and afterwards produces the spark at the burner.



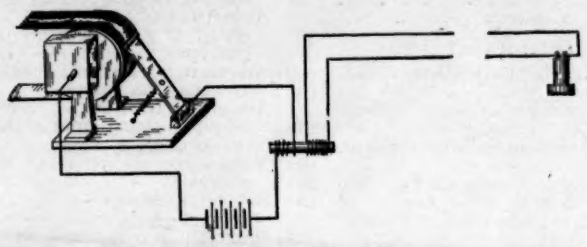
364,619. RELAY INSTRUMENT.

364,271. Telegraphy; L. Maiche, Paris, France. Application filed Oct. 15, 1886. This invention consists in a new automatic distributer of the currents necessary for transmission, which permits the retaining of the ordinary mode of sending and receiving with undiminished rapidity, while affording facility for interruption and repetition as may be required.

364,344 Galvanic Battery Cell; J. R. Hard, New York, N. Y. Application filed Oct. 6, 1886. Means are provided whereby the zinc rod is stripped of the débris of chemical decomposition and surplus liquid as it is drawn out of the battery.

364,356. Telegraphic Alphabet; W. A. Leggo, Montreal, Canada, Assignor to J. Rae and J. C. Simpson, of same place. Application filed June 26, 1886. The letters are formed of dots only, and are distinguished by the grouping of the same.

364,372. Apparatus for Saving Floured Quicksilver; J. H. Rae, Dayton, Nevada. Application filed Feb. 3, 1887. One pole of a dynamo is connected with the bottom of the pan and the other to a frame in the upper part of the pan, the frame carrying downwardly projecting points which extend into the contents of the pan. When a heavy current is let on the fine particles of quicksilver held in suspension in the pan are brought together. See illustration.



364,472. RECORDING AND REPRODUCING SOUND WAVES.

364,429. Electric Clock; G. E. Mejer, Providence, R. I. Application filed Sept. 9, 1886. The pendulum is provided with an inclined plane, and at stated intervals a weight is allowed to impinge against the plane to increase the momentum of the pendulum.

364,444. Annunciator System; Paul Seiler, San Francisco, Cal. Application filed Sept. 16, 1886. This invention is designed for the purpose of enabling persons in charge of an annunciator to answer a call. The call itself causes a drop to fall, and then by pressing on the fallen drop the answering signal is given.

(1) 364,471. Telegraphy; (2) 364,472. Recording and Reproducing Sound Waves; L. Bock, Jr., of New York, N. Y. Applications filed respectively Dec. 11, 1885, Dec. 4, 1886. (1) A circuit controlling film is made for use in retransmission by photographically recording the original impulses or vibrations, and then photographically producing perforations in the plate corresponding to the recorded impulses. (2) A similar film to the above is used for recording and reproducing sounds. See illustration.

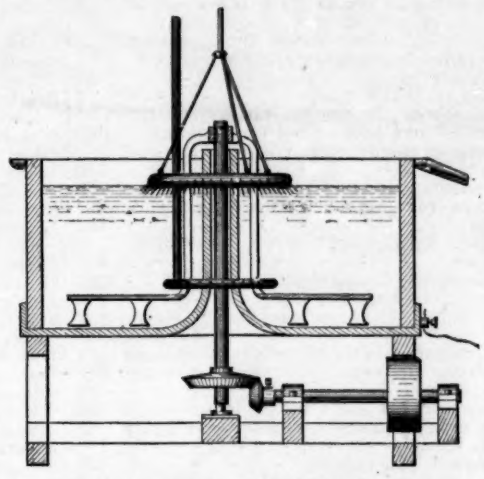
364,475. Telephone Transmitter; J. W. Bonta, Philadelphia, Pa., Assignor to the American National Telephone Co. of N. Y. Application filed Oct. 21, 1886. Means are provided for varying the contact between the rolling electrodes of a telephone by placing them on an adjustable inclined plane.

364,558. Electrical Contact Device for Hose Couplers; W. F. Wamsley and T. McIntosh, Walla Walla, Wash Ter. Application filed Nov. 2, 1886. The usual air-brake hose of trains is used as a conductor of electricity, and the particular invention relates to means for making the electrical connection at the coupling.

364,559. Electrical Contact Device for Hose Couplers; W. F. Wamsley, Walla Walla, Wash. Ter. Application filed Nov. 2, 1886. See brief of No. 364,558.

364 605. Lightning Rod; J. H. Schoonmaker, Winona, Minn., Assignor of two-thirds to H. D. Morse and N. C. Gault, of same place. Application filed Sept. 28, 1886. The combination, with a hollow core, of the strands formed of hollow wires, around which a number of small soft wires are twisted and incased in a covering of copper.

364,619. Relay Instrument; G. T. Woods, Cincinnati, O. Application filed Sept. 17, 1886. Magnets in the main circuit arranged with a separating interval in the same axial line, their contiguous poles exhibiting the same sign of magnetism, with a pair of soft iron armatures in local circuit arranged in said interval across the axial line of the magnets. See illustration.



364,372. APPARATUS FOR SAVING FLOURED QUICKSILVER.

Copies of the specifications and drawings complete of any of the patents mentioned in this record—or of any other patent issued since 1866—can be had from this office for 25 cents. Give the date and number of patent desired, and address Johnston's Patent Agency, Potter Building, New York.

INDEX TO VOLUME IX.

* Illustrated articles. The weekly Departments are not indexed. a Refers to issue of April 23.

REVIEWS OF NEW BOOKS.

"Morrison's Practical Engineer and Mechanics' Guide" - 2
"Static Electricity, Elements of" - 26
"Telegraph Apparatus and Circuits, Connections of" - 26
"Telephonie en Belgique, La" - 26
"Creil, La Verité sur les Experiences de" - 26
"Electric Motor and its Applications, The" - 38
"Patent Laws of All Nations, The" - 38
"Aluminium: Its History, Occurrence, Properties, Metallurgy and Applications, including its Alloys" - 38
"Pump Catechism, The" - 62
"Annuaire du Bureau des Longitudes" - 62
"Telephones Usuels, Les" - 88
"L'Année Electrique" - 116
"Die Anwendung der Elektricität bei Registrirenden Apparaten" - 128
"Century of Electricity, A" - 164
"Elektricitaet und Magnetismus Als Kosmotellurische Kraefte" - 176
"Kalender Fuer Elektrotechniker" - 176
"Practical Electricity" - 176
"Machine Dynamo-Electrique, La" - 188
"Electricians, Lives of the—Tyndall, Wheatstone, Morse" - 188a
"L'Electricité Dans la Maison - 200
"Practical Physics, Lessons in Elementary" - 276
"Technology Quarterly" - 276
"Practical Electric Lighting" - 300
"Machine d'Induzione" - 300
"Practical Electricity" - 288

CORRESPONDENCE.

Air space in the dynamo, The - 155
Air space, Still another suggestion as to the - 177
Ampére-Hour and Watt-Hour - 193a
"Anti-Contact" - 200
Armature insulation - 266
Arrester for each circuit, One - 250
Articles that should be studied - 278
Atmospheric electricity on telephones, The effect of - 122
Battery plates, method of making, Lithanode 180
Battery, The direction of current in a - 292
Batteries for incandescent lighting - 68
Batteries for induction coil and small lamp 213
Bells, A frequent trouble with - 218
Bentley-Knight electric railway system in England, The - 194a
Bentley-Knight electric railway patents, The - 229
Cable electricians - 128
Circular mils - 195a
Closure - 244
Commutator, Flashing at the - 218
Current, Proportioning conductors to - 179
Dann & Lapp telephone, The - 19
Denver electric railway, The - 192, 202
Denver electric railway, Ex-Governor Evans on the - 229
Deprez mirror galvanometer, Operating the 305
Dynamo armature, Copper on the - 228
Dynamo construction, The theory and practice of - 164
Dynamo output per pound of copper. - 205
Dynamo telephones - 57
Dynamos, Output of - 229
Dynamos, The predetermination of the characteristics of - 166
Dynamos per pound of copper, Output of - 192
Earth's magnetism, Horizontal intensity of 292
Earthquakes by electricity, Studying - 276
Eickemeyer dynamo, The - 142
Electricity generated by steam jets - 91
Electric lighting, Safety circuit - 113
Electric motor challenge, An - 78
Electric welding in 1865, - 154
Electric welding, Priority in - 178
Electro-magnets, Construction and use of - 18
"Enode" - 270
Field make and break transmitter - 300
*Field method of motor regulation, The 29
Field motor, Regulation of the - 57
"F. S.," One more answer to - 178
Gas companies and the electric light, - 18
Gas pipes, Sparks from - 266
Galvanic batteries, Patents on bichromate of soda in - 228
Incandescent lamp in England, The - 69
Incandescent lamp switch patents - 192
Incandescent lamps with intermittent currents - 216
Incandescent lamps with low resistances 270
Induction space. The - 201
"Interfield" - 164
"Interpole" - 226
"Interstice", The - 193a
In "the swim" - 180
Insulated wires, Tests of - 290
Invention? What is - 265
Invention? What is - 290
Ironclad transformers of 1848 - 301
Is electricity matter? - 194a
"Kinetic field" - 164
Lightning arresters, The question of - 266
Lighting cars by electricity—the problem solved - 166
Magnets, Demonstrating the mutual action of 301
Magnets, Strong currents in small - 195a
Magnets with consecutive poles - 205
Milan, Italy, Underground work in - 78
Motors, Power required for operating - 216
Partz acid gravity battery, The - 122
Predetermination of the characteristics of dynamos, The - 154
Problem in electricity, A - 154
"Problem in electricity" solved, The - 143
Quadruplex and the series railway, Originality in the - 205
Quadruplex questions - 18
*Resistances, A problem in - 44
Secondary generators, Concerning the history of - 242
Self-regulating motors, The theory of - 128
"Series" electric railways, Priority in, 229, 240
" railway priority - 271
Sprague motor controversy, The - 141
Standard cell, The E. M. F. of a - 204
Stockholm, The telephone in - 191a
Switch, Incandescent lamp - 200
Target, Electric recording - 178
Telegraph, The early days of the - 128
Telephone patents in Canada - 243
Telephony, The extreme importance of attention to little things in - 250
"The gap" - 192
Transformers with relays and commutators - 195a
Twixt irons - 240
Unnamed Space, Names for the - 218
Welding, Priority in electric - 192
Wheatstone and the word "telephone" - 271
Winding magnets - 214
Wood theory as to damage of dynamos by lightning, The - 250

THE TELEGRAPH.

Advertisingmedium, The telegraph pole as an 19
Caledonian Railway, Duplex working of single needle circuits on the - 189
Canada, Government telegraphs in - 43
Canada, Telegraph troubles in - 32
Coast survey telegraphic longitude parties 216
"Creeping joints" in telegraph lines - 166
* District telegraph call box, A new - 188a
Europe, Underground work in - 6
*Field electric street railway system, The 90
*Fire-alarm box, A new, - 155
*Fire-alarm and police patrol telegraph system - 270
*Fire and police telegraphs, Improvements in - 119
*Fire system, A new - 39
French cable company and the "pool," The 31
India, The telegraph in - 218
*Lamson store service in the operating room, The - 305
Land grant railroad telegraphs - 9
Latin-American telegraph figures - 8
Mexico, The electrical industries of. IV. Telegraphy - 277
Mexican telegraph earnings - 145
New York, Underground work in - 63
Operator remembered, A deserving - 30
Postal telegraph bill, The new - 67
Protection of submarine cables, Conference on the - 203
Queensland, Telegraphs in - 19
*Receiving instrument, A curious telegraph 41
Signal service, The future of the - 54
*Sounder and telegraphic key, A novel - 141
Submarine telegraphs of the world, The - 50
Subway legislation, New York - 90
Subway commission, Annual report of the New York - 81
Subway management, New - 18
*Synchronous multiplex telegraphy, improvements in - 55
*Telegraph arrangement, A novel - 31
Telegraph of 1622, The - 306
*Three-wire distribution, A new method of regulation for - 193
Tonquin, Native improvements in telegraphy in - 44
Western Union figures - 292
Western Union wires, Leaks on - 55
Western Union stock - 193
Wooden poles, Preservation of - 194a
*Writing telegraph, A new - 193a
*Vertically suspended wires, The electrical conductivity of - 191

TELEPHONE.

American Bell Telephone Company, Annual meeting of the - 170
Attention to little things in telephony, The extreme importance of - 244
Bourseul magneto telephone of 1854, The 245
Brussels telephone exhibition, The - 67
*Cincinnati telephone exchange, The new - 113
*Distance of speech by telephone, On the limiting - 190
*Duplex telephony - 116
"Dynamo" Telephones - 15
*Electro-magnets in telephone circuits, On the retarding effects of - 3, 53, 121, 140, 216
*Elgin mechanical telephone, The - 121
*Hall's telephone trumpet - 193
India, The telephone in - 181
Indiana, How the telephone law works in - 68
Intermittent current telephone transmitters 133
Kansas City telephone exchange ball, The 4
*Make and break telephone transmitter, A new - 277
*Metallic masses in the human body by means of the induction balance and the telephone probe, On the detecting and locating of - 202
Mexico, The electrical industries of. III. Telephony - 265
New England, The telephone in - 214
*Railway telegraph telephone receiver - 64
Subways, New York - 201
Supreme Court, The telephone suits before the - 66
Swedish telephone palace, A - 117
*Telephone, A novel - 9
Telephone poles, A decision as to - 29
*Telephonic investigations - 146, 158, 166, 178
*Telephone circuits, Retarding effect of electro-magnets in - 302
Telephony, The extreme importance of attention to little things in. Part I.-II. 212, 230
Transmitter, A red-hot telephone - 189

ELECTRIC LIGHT.

Accumulators, Lighting by - - - 81
Alternating currents for measuring liquid resistances, On the employment of - 19
Alternating currents, Distribution by - - 111
*Alternating currents and transformers, Electrical distribution by - - - 231
*Alternating currents, Novel phenomena of 258
*American system of electric lighting, Recent improvements in the - - - 189a
*Arc lamps on incandescent circuits - - 18
Arc lamp with pneumatic regulator, An - 303
Arc without contact, Methods of starting an 215
*Bernstein's system of lighting with low resistance incandescent lamps - - 56
Boston, The Edison plant in - - - - 40
Boston, Rates for electric lighting in - 17
Brush dynamo machines, Success of colossal 56
*Carbon filaments, On the change from negative to positive of the temperature coefficients of some - - - - 269
Central station construction - - - 267
*Circuit for electric lights, Safety - - 43
Collieries, The electric light in - - - 181
*Cowles Company at Lockport, N. Y., The water power of the - - - - 63
*Cut-out and restorer for incandescent lamps on arc circuits, An automatic - 188
*Diehl's induction system for operating incandescent lamps on arc circuits - - 79
*Domestic electric lighting - - - - 228
Edison vs. Westinghouse - - - - 7
Eiffel tower, Electric lighting from the 31
Electric Light Association, The National 295
Electric light convention, Western comments on the - - - - - - - - 140
Electric light industry in 1887, The - 50
*Engine for electric lighting purposes, A new - - - - - - - - - 193
*Engine for electric lighting, A new automatic - - - - - - - - - 154
England, The incandescent lamp in - - 69
*Fittings, New electric light - - - 213
Glow lamps, Their use and manufacture, 14, 32, 42, 56
Gas companies in the electric light business 74
*Hammer's incandescent lamp attacher and detacher - - - - - - - 54
*Harcourt's pentane standard lamp - - 300
High tension currents, Incandescent lights on - - - - - - - - - 110
*Hood's electric light - - - - - - 95
*Incandescent lamps on arc light circuits - 266
*Indianapolis Jenney electric light tower, The - - - - - - - - - 68
Inspectorships, Examination questions for electric light - - - - - - 30
Installation of electric light plants, The - 26
Insurance, Electric light - - - - 81
Laboratories, The electric light in - - 306
Legal bureau for the National Electric Light Association, A - - - - 10
Lighting commission, A New York State - 20
Lighting railway trains by electricity - 140
Local companies to make their own carbons, 306
*Long-distance distribution of electrical energy - - - - - - - - 170
Long-distance incandescent lighting - - 80
*Loomis electric lighting system, The - 243
Mexico, The electrical industries of. II. Electric lighting - - - 238
*Milan, Italy, The Edison central station at 51
Mining lamp, Settle's electric - - - 38
*Municipal lighting, The Edison system of 78
National Electric Light Association, The exhibits in the - - - - - 112
Paris Exhibition of 1889, Lighting the - 191
*Peoria, Ill., The Fort Wayne Jenney station at - - - - - - - - 89
*Philadelphia Brush Electric Light Station, The - - - - - - - - - 75
Prejudice against electric light wires, Popular - - - - - - - - - 102
*Radiator, An electric light - - - - 95
*Railway cars by primary batteries, Lighting - - - - - - - - - 15
Range finding by electric light - - - 300
Rochester, The Edison convention at - - 89
*Safety circuit for electric lighting - - 92
Safety lamp, A new electric - - - 303
Schuyler Company, Re-organization of the 169
Secondary generators - - - - - - 110
*Secondary generators, The distribution of electricity by - - - - - - 156
Secondary generators, A discussion on - 145
*Secondary generator, The Gaulard-Gibbs 164
*Secondary generators, Note on - - - *164
Secondary generators, A new method of testing - - - - - - - - 188
*Series Incandescent Lamps - - - - 55
*"Simplex" arc lamp for incandescent circuits, The - - - - - - - 215
Steam plants for electric lighting - - 106
Suez Canal, Lighting the - - - - 145
*Switch-board, A new electric light - 81
*Transformers, Distribution by - - - 43
U. S. Navy, Electric lighting in the - - 200
Varnishing, Incandescent lamps, On - - 191a
*Water wheels for electric lighting, Twin - 181
Westinghouse transformer system, The - 32
*Wood electric light switch-board, The - 229
*Zipernowski transformers, Central station lighting by - - - - - - - 27

ELECTRIC MOTORS.

*Baxter electric motor, The - - - - 279
*C. & C. Electric Motor Company, The small motor of the - - - - - - 203
*Centrifugal governor for electric motors - 180
Efficiency of small electric motors, The - 302
Electric motors - - - - - - 104, 107
Electric motors, Efficiency of - - - 213
Electric motors, The future of - - - 109
Governors for electric motors - - - 15
*Hochhausen motor for constant potential circuits - - - - - - - 193a
*Hochhausen's electric motor - - - 154
*Immisch motor, The - - - - - 41
Motor construction, Details of - - - 4
Motors for electric lighting - - - 28
*Small motors, The practical requirements of - - - - - - - - - 93
*Sprague motor, A new - - - - - 29

ELECTRIC RAILWAYS.

*Orange, N. J., The Daft electric railway - - - - - - - - - 191
*Pollak and Binswanger's electric railway system - - - - - - - - 239
*Short-Nesmith electric railway system, The - - - - - - - - - 168
*Sprague railway at Richmond, Va., The 265
Street cars, The electric motor applied to 109
*Bentley-Knight electric railway system, The - - - - - - - - - 5
Bentley-Knight electric railway for New York, The - - - - - - - 5
*Conduits, Electric and cable railway - 16
*Denver, Col., The electric railway at - 153
Electric railways, A few comparative statistics of - - - - - - - 267
Electricity vs. cables - - - - - - 16
Elevated railroad, The Sprague experiments on the - - - - - - - 15
*Enos elevated electric railway system, The 214
*Field's electric street car - - - - 142
Fulton Street electric railway, The - 16
Fulton street, New York, Electric street cars for - - - - - - - 29
*Los Angeles electric railway - - - 177
Los Angeles, Cal., The Daft electric road at 44
*Montgomery, Ala., electric railway, The 133
*Montgomery, Ala., electric railway, The Van Depoele generator for the - - - 201
*Overhead gear of the Daft electric railway - - - - - - - - - 303

DYNAMOS.

*Driving dynamos - - - - - - 121
*Dynamos, The predetermination of the characteristics of - - - - - 116
*Dynamo quadruplex, Working - - - 64
*Eickemeyer's dynamo machine. - - - 132
*Elwell-Parker alternate current dynamo, The - - - - - - - - 191
French dynamo designs - - - - - 19
*Gramme dynamo, The relation between the cross-section of the iron in armature and field of the - - - - - - - 255
Lightning, Danger to dynamos from - - 239
*Multipolar dynamo, A new - - - - 216
*Pole pieces and dynamo construction, On 62
*Pole pieces and dynamo construction, The value of - - - - - - - - 176
Pole pieces and dynamo construction, - - 40
*Pole pieces and dynamo construction, - 144
*Pole pieces and dynamo construction, - 188a
*Regulator, A dynamo - - - - - 217
*Shunt-wound dynamo, To determine graphically the external characteristic of a 116

BATTERIES.

*Accumulators, Switch-board for charging - 143
*Battery, A new primary - - - - 264
Battery plates, A new method of making - 121
*Battery solution, A new - - - - 194a
Car lighting by means of storage batteries - 153
Cell, A pocket Daniell - - - - - 153
Cell, A new standard - - - - - - 188
Charging secondary batteries by means of a low-potential magneto-electric machine- 214
*Cut out for secondary batteries, Automatic 130
*De Montaud accumulator, The - - - 64
Electrodes, A new method of forming secondary battery - - - - - - - 19
Electromotive force of batteries, Calculation of the - - - - - - - - 194
Electrolyte for galvanic batteries, A new - 42
History of the storage battery, A short - 21
Incandescent lighting, Batteries for - - 6
*Installation of storage batteries, A recent 227
*Julien secondary cell, The - - - - 240
Lechanché battery for electric lighting, The 300
Mercury connections for secondary batteries - - - - - - - - - 188
*Microphone open circuit battery, The - 155
*Paris city hall, A one hundred horse-power storage battery at the - - - 205
*Storage battery plates, Novel construction for - - - - - - - - - 191
Storage battery of high electromotive force, A - - - - - - - - 180
Storage battery industry, The growth of the - - - - - - - - - 181
Storage batteries, Practical notes concerning the construction, use and management of (continued) - - - - - 20
Storage batteries in practice - - - 253
*Storage batteries, The manufacture of - 289
Street cars, A practical test of storage batteries on - - - - - - - 280
*Switches for storage batteries, automatic 212
Walker's sulphur sal-ammoniac battery 92
Water battery, On a simple and convenient form of - - - - - - - - 200

MISCELLANEOUS.

Air, The passage of an electric current - 195a
*Alarm, An automatic electric danger - 278
Aluminium, The production of, with special reference to the electrical method - 30
American Institute of Electrical Engineers, 215, 226
American Institute of Electrical Engineers, Annual meeting of the - 238, 251, 267
American Institute of Electrical Engineers, report of the committee on permanent quarters - - - - - - - - 256
American Institute of Electrical Engineers, The house fund of the - - 250, 264, 276
American Institute of Electrical Engineers, The house fund of the - 288, 300
*Annunciator, A novel - - - - - 215
Aurora borealis, The—An electrical phenomenon - - - - - - - - 182
Balloon signaling - - - - - - 152
*Bâton, An electric - - - - - - 67
*Bell, A new iron frame - - - - - 292
*Bell, A new vibrating - - - - - 306
Belting, Transmission of power by - 104
*Bickford electric train signal system, The 117
*Binding post, A novel - - - - - 232
*Boiler, An electric - - - - - - 200
Books, Two new - - - - - - - 19
*Box bell and annunciator, A new indicating - - - - - - - - - 167
*Box bell, A new - - - - - - - 19
Brake tests, Electric - - - - - 270
*Brakes, Ries' system of electric - - 120
British electricians' jubilee dinner, The - 304
*Burglar alarm, An improved automatic - 145
Burlington brake tests, The - - - 301
*Buzzer, A musical - - - - - - 217
*Cab signal, Wick's railway - - - 192a
*Cardew voltmeter, The - - - - - 43
Chemical analysis, The use of electro dissolution in - - - - - - - - 306
Circulation of the blood, A new theory regarding - - - - - - - - 283
*Clock, A combination electric - - - 217
*Clokey's electric branch conduit - - 283
Coal into mechanical energy, Converting the heat energy of - - - - - 109
*Compound engine and vertical boiler, A new - - - - - - - - - 206
*Conductors, Lead incased - - - - 270
Contact electricity - - - - - - 18
Contact resistance, Variation of - - - 192a
Contact transmitters, An early reference to variable - - - - - - - 164
Convention, Notes of the - - - - 112
Conversion of heat into electrical energy, Direct - - - - - - - - 180
"Cross-fire" on electrical circuits - 130, 176
*Cut-out for electric gas lighting circuits, Automatic - - - - - - - - 91
De Meritens, The, process for rendering iron inoxidizable - - - - - - 80
Diamagnetic space, The - - - - - 190
*Diehl's Gramme armature - - - - 92
*Dispatch tube system, An electro-pneumatic - - - - - - - - - 189
Dr. Aron's integrating ampère meter - 306
*Earthquakes by electricity, Studying, 129, 143, 152, 165, 179
Electricity? What is - - - - - - 239
Electricity, New applications of - - 116
Electricity and its relation to heat, Clausius on - - - - - - - - - 16
*Electricity, A problem in - - - - 130
Electricity, On the nature of - - - 212
Electricity, Speculations on the nature of 227
*Electrical department of the city of Philadelphia, The - - - - - - - 77
*Electrical distribution, Economical - 291
Electrical exhibition in New York, An - 250
Electrical exhibition, The American Institute - - - - - - - - - 264
Electrical invention and research, Originality in - - - - - - - - - 14
Electrical and mechanical units and phenomena, Analogies between - - - 8
*Electric measuring instruments, Sir Wm. Thomson's new - - - - - - 293
Electrical progress of the year, The - - 2
Electric current as a fixture, The - - 195
*Electrician, Philadelphia's first - - - 76
*Electro-magnets, A novel form of armature for - - - - - - - - 293
Electrolysis, On mechanical and thermal effects accompanying - - - - - 14
Electrolytic polarization produced by small electromotive forces - - - - - 190a
Electrolytic preparations of metals, Some 39
"For high insulation" - - - - - 101
*Franklin Institute and its work, The - 74
French Academy prizes, The - - - 51
*Galvanometer coil when the needle is displaced along the axis, The correction factor of a - - - - - - - - - 294
*Gas lighter, A novel electric - - - - 167
Gases, Hall's phenomenon in - - - - 92
*Gauge, The new Edison standard - - - 65
*Gong, New electro-mechanical - - - - 145
*Headlight hanger, A - - - - - 155
*Heat by electrical and mechanical contrivances, Recent improvements in the regulation of - - - - - - - - 131
*Holcomb's electrical communicating system - - - - - - - - - 241
*Hotel annunciator, A new - - - - 155
*Hot journal indicator, Electric - - - - 181
Howell's carbon cutting machine - - 190a
*Hunter's friction clutch pulley and cut off coupling - - - - - - - - 68
*Induction coils graphically treated - 281
Induction coil, On the reversibility of the 213
Induction coil, On the reversibility of the 192a
Inductive capacity, Specific - - - - 44
Insurance, Electricity in its relation to - 81
Invention, The history of an electrical 188
"Is electricity matter?" - - - - - 306
Italian government regulations for electrical circuits - - - - - - - - 226
Japan, A short sketch of the progress of electrical engineering in - - - - 112
*Lightning conductors, Apparatus for testing - - - - - - - - - 219
*Liquids under the influence of the electric current, Surface tension of - - - 180
*Magnets, Multipled - - - - - - 53
" in magnetic fields of different intensity, On the specific induction of - 81
Magnetic resistance, Note on - - - - 188
*Magnetism, Some practical questions in - - - - - - - - 118, 134
Magnetism on strength of iron and steel, Effects of - - - - - - - - 292
*Marine-sounder and shoal water alarm, Irish's electric - - - - - - - 41
*Metals, Working by the direct application of the electric current - - - - 283
Mexico, The electrical industries of. I. Electrical matters in general - - - 226
*Milling machine, profiler and vertical spindle - - - - - - - - 181
Mistaken identity, A case of - - - - 145
"Nautilus," The submarine boat - - - 20
Obituary—Daniel Davis - - - - - 166
One hundredth meeting of the New York Electrical Society, Celebration of the - 240
Ordnance, Electric night sight for - - 177
*Packard vacuum pump, The - - - - 91
Paris exhibition of sciences and industrial arts, Electricity at the - - - 20
Patents in the courts - - - - - 200
Patents, Filing electrical, for reference - 167
Patents, Electrical - - - - - - 66
Patent office reform - - - - - - 112
Patent system, Reforms in the - - - - 103
Pendulum experiments - - - - - 306
Philadelphia meeting of the National Electric Light Association. President's opening address. List of members and visitors - - - - - - - - - 88, 100
*Push button, A floor - - - - - 212
*Push button, An improved - - - - 305
*Push button, An improved - - - - 134
*Preece, William Henry - - - - - 230
Probing by electricity - - - - - 121
Pyro-electricity - - - - - - - 280
Pyrometer, The electric - - - - - 130
Railway accidents and the means of their prevention - - - - - - - - 26
*Rheostat, On the differing temperature coefficients of the different coils of a fine - 254
Roosevelt, Death of Hilborne L. - - - 19
*Rowan's electro-magnetic machine tools 301
Resistance, The problem in - - - - 271
Resistance, Another problem in - - - 213
*Resistance, An answer to the problem in - 244
Resistance coils, Polarization of - - - 39, 89
Safe lock, An electric - - - - - 43
*Shot firing apparatus, Portable electric - 134
*Speaking tube and call-bell system, Combined - - - - - - - - - 217
Spiral springs for measuring instruments, The employment of - - - - - - 117
Statue, The stability of the - - - - 17
*Stevens' Institute, The electrical facilities of the - - - - - - - - 132
*Switch, A novel main - - - - - 167
Target indicator, An automatic - - - 118
Terrestrial magnetic disturbances and solar phenomena, On the connection between - 141
*Testing apparatus, Improved - - - - 155
Theory and practice, Electrical - - - 192a
*Thomson Rice distributor, The - - - 218
Thunderstorms, The study of - - - - 44
"Transode," The - - - - - - - 216
*Victor turbine for driving dynamos - - 306
"Visual synchronism" - - - - - 240
Warfare, Electricity in - - - - - 67
*Warner electric time system, The - - 215
*Water-wheel governor, An electric - - 133
*Werner Siemens - - - - - - - 92
Wire gauge, A report on - - - - - 295
Wire gauge, Report of committee on - - 100
*Worth's electric air pump - - - - 142

POETRY.

Message on the wires, The - - - - - 182